

ONS00461
10/603,257Amendments to the Claims

1. (currently amended): A method for forming a direct chip attach device comprising the steps of:
 - attaching an electronic chip to a lead frame structure, wherein the electronic chip includes a bonding pad;
 - attaching a conductive bump to the bonding pad;
 - placing the electronic chip and lead frame structure into a molding apparatus, wherein the molding apparatus has a well portion with a pin reversibly coupled to a first surface of the well portion;
 - contacting the pin to the conductive bump; and
 - molding the electronic chip with an encapsulating material, wherein the pin masks the conductive bump to provide an opening in the encapsulating material over the conductive bump, and wherein the conductive bump is recessed within the opening.
2. (currently amended): The method of claim 1 wherein the step of placing the electronic chip and the lead frame structure into the molding apparatus includes placing the electronic chip and the lead frame structure into the molding apparatus, wherein the well portion has a plurality of pins reversibly coupled to the first surface.
3. (currently amended): The method of claim 1 further comprising the step of forming a barrier layer overlying the conductive bump after the molding step. wherein the step of attaching the conductive bump includes attaching a gold stud to the bonding pad.

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4. (original): The method of claim 1 further comprising the step of coupling a solder ball to the electronic chip in the opening.

5. (original): The method of claim 1 wherein the step of placing the electronic chip and the lead frame structure into the molding apparatus includes placing the electronic chip and the lead frame structure into the molding apparatus, wherein the pin has a flat upper surface and rounded upper edges.

6. (original): The method of claim 1, wherein the step of attaching the electronic chip to the lead frame structure includes attaching a power MOSFET device.

7. (currently amended): A process for forming a flip-chip device comprising the steps of:

placing a sub-assembly into a mold apparatus having a cavity, wherein the sub-assembly comprises an electronic chip attached to a support substrate, and wherein the electronic chip ~~comprises~~ has a first conductive stud coupled to the electronic chip;

contacting the first conductive stud with a first blocking device in the cavity; and

injecting an encapsulating material into the cavity to encapsulate the electronic chip, wherein the first blocking device masks the first conductive stud to form an opening in the flip-chip device, wherein the opening comprises a chamfered edge, and wherein the first conductive stud is recessed within the opening.

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8. (original): The process of claim 7 further comprising the step of attaching a solder ball to the flip-chip device in the opening.

9. (currently amended): The process of claim 7 wherein the step of contacting the first conductive stud includes contacting the first conductive stud with a pin reversibly coupled to the mold apparatus.

10. (currently amended): The method of claim 9, wherein the step of contacting includes contacting the first conductive stud with a pin having a flat upper surface and rounded upper edges to form [(a)] the chamfered opening.

11. (original): The method of claim 7, wherein the step of placing the sub-assembly includes placing a sub-assembly having an electronic chip attached to a support substrate, wherein the support substrate includes a flag.

12. (original): The method of claim 11, further comprising the step of contacting the flag with a second blocking device in the cavity.

13. (original): The method of claim 7, wherein the step of placing the sub-assembly includes placing a sub-assembly comprising a power MOSFET device attached to a support substrate.

14. (currently amended): The method of claim 7, further comprising the step of forming a barrier layer overlying the first conductive stud. ~~wherein the step of placing the sub-assembly includes placing a sub-assembly~~

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~~having a gold conductive stud coupled to the electronic chip.~~

15. (original): The method of claim 7, wherein the step of placing the sub-assembly includes placing a sub-assembly having an electronic chip attached to a support substrate, wherein the support substrate includes a flag with a second conductive stud attached to the flag.

16. (original): The method of claim 15, further comprising the step of contacting the second conductive stud with a second blocking device in the cavity.

Claims 17-20 (cancelled).

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21. (new): A method for forming a semiconductor device comprising the steps of:

placing a sub-assembly into a mold apparatus having a cavity, wherein the sub-assembly comprises an electronic chip attached to a support substrate, and wherein the electronic chip has a first conductive stud coupled thereto, and wherein the support substrate further includes a flag having a second conductive stud coupled thereto;

contacting the first conductive stud with a first blocking device in the cavity;

contacting the second conductive stud with a second blocking device in the cavity;

injecting an encapsulating material into the cavity to encapsulate the electronic chip and the flag, wherein the first blocking device masks the first conductive stud to form a first opening having a chamfered edge in the encapsulating material and overlying the first conductive stud, and wherein the second blocking device masks the second conductive stud to form a second opening having a chamfered edge in the encapsulating material and overlying the second conductive stud;

attaching a first solder ball to the first conductive stud through the first opening, wherein the chamfered edge of the first opening is configured to enhance alignment of the first solder ball in the first opening; and

attaching a second solder ball to the second conductive stud through the second opening, wherein the chamfered edge of the second opening is configured to enhance alignment of the second solder in the second opening.

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22. (new): The method of claim 21 further comprising the step of forming a barrier layer overlying the first and second conductive studs.

23. (new): The method of claim 22 wherein the step of forming the barrier layer includes forming a barrier layer comprising nickel.

24. (new): The method of claim 21, wherein the step of contacting the first conductive stud with the first blocking device includes contacting the first conductive stud with a pin having a flat contact surface and rounded edges adjacent the flat contact surface, and wherein the pin is reversibly coupled to the cavity.